

ABSTRACT

An aqueous lubricant is provided which by simple application onto metal surfaces forms lubricating films required for heavy working of metals, and which contains no oil. The aqueous lubricant is prepared by suspending or dispersing a metal chelate compound in water with a surfactant or the like. The metal chelate compound has a polydentate or multidentate chelate ligand, in which at least one of the coordinating atoms is sulfur, coordinated to the coordination site of at least one metal species selected from among zinc, manganese, iron, molybdenum, tin and antimony. When applied onto metal surfaces, the aqueous lubricant forms effective lubricating films on the metal surfaces. The lubricating films contain sulfur as coordinating atoms and therefore, extreme pressure produces sulfur radicals through decomposition by tribo-chemical reactions. The sulfur radicals are highly reactive and react rapidly with the metal surface to produce metal sulfides with a lubricating effect. The sulfur radicals also react with metal ions produced by decomposition of the metal chelate compound, also producing metal sulfides with a lubricating effect. The aqueous lubricants thus exhibit a satisfactory lubricating effect.